Testimony of Nancy McNabb, AIA
NFPA Director, Government Affairs
House Science Committee
Investigation of World Trade Center Collapse
26 October 2005

Good morning Chairman Boehlert and Ranking Member Gordon and Committee Members. My name is Nancy McNabb and I am the Director for Government Affairs for NFPA (the National Fire Protection Association) headquartered in Quincy, Massachusetts. I am a licensed architect and was formerly the Assistant Director for Code Development and Interpretation for the State of New York. I appreciate the opportunity to address the committee this morning regarding *Report of the National Construction Safety Team on the Collapse of the World Trade Center Towers*. Dr. Shyam Sunder, Dr. William Grosshandler and their teams at the NIST labs have done outstanding work.

NFPA is a 109 year old, private, non-profit organization whose mission is to reduce the burden of fire and other hazards on the quality of life. We achieve that mission by advocating consensus codes and standards, research, training and education. We have approximately 79,000 members that come from 80 nations around the world.

I am here today to affirm our support for the efforts of NIST regarding their report. In most cases, resolution and implementation of their recommendations will be a long term process. We have provided the committee with copies of our detailed responses to the NIST study, portions of which I will speak to today.

On September 11, 2001, we witnessed the most terrible acts of violence ever committed in our country. The destruction of the WTC towers, the large loss of life of building occupants and first responders demands answers from the federal government. The first effort directed at this loss included the Building Performance Study (BPS) that was conducted by FEMA. NFPA participated as a team member in order to contribute to the collection, observation and recommendations process surrounding the sequence of events and triggering mechanisms that resulted in the catastrophic building failures and loss of so many lives.

The FEMA study, completed in just 8 months, established a series of preliminary observations including credible theories, hypotheses and a likely sequence of events that led to the progressive collapse of WTC 1, 2 and 7. As thorough as the FEMA BPS report was, almost every preliminary recommendation needed additional study. This committee recognized the need to take action and passed the National Construction Safety Team Act under Public Law 107-231 (NCSTA) in 2002 authorizing the National Institute of Standards and Technology, NIST, as the responsible agency. Congress selected the premier government scientific institution that has the capability, resources and the capacity to conduct complex building loss investigations.

The report, the second issued under the authority of the NCST, shows that NIST is committed to providing a high level of scientific data and a set of recommendations for future consideration by codes and standards developers. NFPA is pleased to see the work effort of NIST resulting in positions on many controversial and sometimes, unpopular subjects. However, the need to conduct more research in numerous areas is clear.

The loss of the WTC complex represents an unusual set of building performance circumstances, both independent and interdependent. Fundamental questions such as why did each tower remain standing after the initial aircraft impacts, what factors influenced the collapse of the two towers and what features either allowed so many occupants to escape or prevented occupants from escaping now have some answers. Other difficult and anguishing questions such as what was the fate of mobility impaired occupants, and why were the local communication systems overwhelmed and did this prevent or delay evacuation warnings to the first responders, at least now we have some explanation.

In June of 2002, when the intensive, three year Federal Building and Fire Safety Investigation of the World Trade Center Disaster was initiated, our President and CEO, Jim Shannon, testified at a public hearing held in New York City that outlined the NIST objectives for their work plan, investigation approach, and intended outcomes. It would have been easy for the federal government to simply say "*This was a one time, extreme event.*" or "*We do not, nor cannot design buildings for, or learn anything new from such extraordinary events.*" but that would be contrary to how the US conducts its business and how NFPA identifies needs and emerging issues for the development of new and improved safety codes and standards. Let me assure you that NIST has accomplished a great deal with their studies, analyses and recommendations.

Even those skeptics and critics of NIST and its report in the end chose to submit constructive comments. The NCST Federal Advisory Committee, who provided guidance to NIST during the investigation, the engineers and scientists from NIST who provided support to this effort, and the group of private organizations who served as contractors to NIST on various aspects of the project are to be commended. They have provided a convincing amount of evidence, rigorous analyses, hypotheses and confirmation.

One critical test of the effectiveness of the WTC study will be what will happen with the 30 specific recommendations in the final report. Some of them have already been implemented in several NFPA codes. This was possible because of the open approach that NIST took with the investigation. In particular, Dr. Sunder's commitment to provide public briefings, opportunities for input during media briefings and open meetings and making critical information available on the NIST WTC website. While some changes have been made, it is important to note that it is likely, that after a thorough and detailed analysis of the final recommendations, there may not be sufficient data, detail or compelling evidence to promulgate a change to a particular safety code or standard.

For example, the on-going debate about whether building regulations should address events associated with normal building hazards, or more extreme events such as hostile acts and explosions, and what category of buildings should have these unique measures imposed on them, will have to be settled before consensus is reached on many of the recommendations and findings.

Because of this study, NFPA codes and standards have been changed to include:

- Integration of performance-based design options.
- Retroactive requirements for installation of automatic sprinkler systems in high rise buildings.
- Hourly fire resistance ratings of 3 hour and 4 hour duration for tall buildings.
- Integration of the structural frame approach when determining fire resistance ratings.
- Requirements for wider stairs to address counterflow issues based on occupant load.
- Mandates for the Installation of stair descent devices for persons with mobility impairments.

A number of long term initiatives are also underway to address other subjects including the protocols used to evaluate the performance of building structural systems under fire conditions. Although NIST has not indicated that the current procedures are inadequate, a review of the test methods and structural system evaluations is warranted.

One recommendation that should receive a high priority is the consideration for elevator use in high rise emergency evacuations. NIST has led the effort in this area with participation the private sector to establish the circumstances and criteria for making this a reality.

Exhibit A provides you with NFPA's comments to NIST's NCSTAR1 Report; exhibit B contains a summary of changes already effected by NFPA because of the NIST study, or that are in progress at some level.

Beyond this, several of the recommendations refer to specific identification and quantification of multiple threats or hazards. This implies the need for risk and hazard analyses, and the utilization of performance-based design techniques. Overall, NFPA supports these concepts building and fire regulations. However, the design of buildings, the assessment of the existing building stock, and the preparation of emergency response plans, must be an integral part of our collective mind set.

While NFPA recognizes the benefits of risk and hazard analyses and performance-based design, we note that many of the tools and data necessary to do this on a routine basis are not yet available. Nor are they sufficiently understood by all parties that routinely make decisions about building construction, occupant safety and emergency responder operations. We have to make sure that those who live or work in a high rise, those who design and construct a high rise and those that come to our aid in a high rise are aware of the limitations of our technology, procedures and codes.

While it is too early to establish the lessons learned from the report, we have made a significant start. We have much yet to be done. Before we arrive at an appropriate "best practices" that will advance the level of safety in the built environment more evaluation is necessary.

I can assure you that NFPA will continue to be thorough in reviewing, evaluating and implementing those NIST recommendations that are directed at the broad issue of public and first responder safety. After the comprehensive study that NIST has provided to us, to learn nothing and do nothing would be delinquent.

Likewise, it would be unthinkable if the private sector fails to act with due regard for these recommendations, and if our government institutions, such as the General Services Administration, fail to recognize the opportunities to develop new building safety enhancements. NIST has provided us with a public service and a tremendous resource. It will be up to all of us to make certain that we do not waste this unique opportunity to ask ourselves new questions, learn lessons and develop better building safety codes and standards.

Thank you again for allowing me the opportunity to present the views of NFPA this morning. I will be happy to answer any questions you may have.

EXHIBIT A

NFPA COMMENTS TO NCSTAR 1 (Bound Copy)

EXHIBIT B Changes made or pending to NFPA documents or programs relating to some aspect of *The WTC* terrorist attacks

SUBJECT	CODE/STANDARD/ PROGRAM	STATUS
Hourly fire resistance ratings used on certain tall buildings established at 3 hours and 4 hours.	NFPA 5000	Completed for 2003 edition.
Increase in Stair Width from a 44 in. minimum to a 56 in. minimum when the stair handles a population of 2000 or more occupants.	NFPA 101/NFPA 5000	Completed for 2006 editions.
Mandates for installation of stair descent devices for persons with mobility impairments under certain conditions.	NFPA 101/NFPA 5000	Completed for 2006 editions.
Adoption of structural frame approach for fire resistance ratings.	NFPA 5000	Completed for 2006 edition.
Integrate performance based design options into codes.	NFPA 101/ NFPA 5000	Completed for 2000 ed of NFPA 101/2003 ed of NFPA 5000
Assure that existing buildings meet some minimum level of safety or performance	NFPA 1/NFPA 101	Completed for all editions of NFPA 101 (1913 forward) and NFPA 1 since 1992.
Review fire test standards (i.e. NFPA 251) to determine if the protocol is indicative of appropriately challenging fires.	Various	Pending as future task.
Provide enhancement features for robust building systems.	Various	Ongoing task with various completion dates.
Improved fire alarm system features. Specifically, incorporating mass evacuation alarm components and audible/directional alarm features	NFPA 72	Pending completion for the 2007 edition (available September 2006).
Improved building occupant preparedness for building emergencies	NFPA Public Education programs	Ongoing task with various completion dates and continuous updates.
Expanded use of elevators during building emergencies by occupants.	NFPA 101/NFPA 5000	Pending as future task with anticipated completion in 2007/2008.

Nancy McNabb, AIA

Nancy McNabb is the Director Government Affairs for the National Fire Protection Association (NFPA) at their Government Affairs Office in Washington, DC. She is responsible for working with congressional and federal agencies as well as allied organizations to promote the NFPA mission about fire and life safety. Ms. McNabb joined NFPA in September 2001 as the regional manager, building code central field office, located in Dallas, TX.

Before joining NFPA, McNabb was a service coordinator for Building Officials and Code Administrators (BOCA) International, where she facilitated code adoptions, conducted trainings on code interpretations, and represented the organization at legislative hearings. Previously, she served as a staff architect for BOCA, working with building officials in New York State and providing member services throughout the region. Nancy was also assistant director for code development and code interpretation for the New York State Department of State, codes division.

McNabb holds a master's degree in architecture in structures and a bachelor's of science degree in architecture from the University of Illinois at Champaign/Urbana, as well as a bachelor's degree in fine arts from Bradley University. She is a registered architect in New York and Pennsylvania.

McNabb's contact information is as follows:

Nancy McNabb, AIA
Director, Government Affairs
499 South Capitol Street, SW
Suite 518
Washington, DC 20003
Phone: 202-488-4428
Fax: 202-488-4452
nmcnabb@nfpa.org